

REMARKS

By this submission claims 3, 14, 15, 17 and 18 are amended, and also claims 1, 2, 4-13, 16 and 19-24 continue to be pending. No new matter is introduced by the now submitted amendments.

It is requested in view of the submitted amendments and the following discussions that all reported rejections and objections in the outstanding Office action be reconsidered and not repeated in any further action issued for this application.

Twenty of the pending claims are reported as either allowed or as objected to as being dependent upon a rejected base claim, but that such objected to claims would be allowable if rewritten in independent form. Accordingly, discussions directed to these twenty of the twenty-four pending claims are set out first.

Allowable Subject Matter

Claims 4-11, 15 and 18-24 are reported as being allowed. The report of these allowances is acknowledged with gratitude in the understanding that such reported allowances are in compliance with the authorizations and requirements conferred under Title 35 United States Code and Title 37 Code of Federal Regulations to and by the Patent and Trademark Office to grant patents.

Further reported in this section of the action are objections to claims 3, 14, 16 and 17 as being dependent upon rejected base claims, but that these four claims would be allowable if rewritten in independent form including all of the limitations of base claims and any intervening claims. These claims have been so rewritten and now as amended are believed to overcome the reported objections. Specifically, claims 3 and 14 are amended to be in independent form to

include all limitations of base claims and any intervening claims. The remaining reported objected to claims, i.e., 16 and 17, are dependent from claim 14 that now has been amended to be in allowable form as reported in the action.

As a final note, claims 15, 17 and 18 are amended by this submission to correct obvious typographical errors. These amendments are not directed to in any way alter scopes of covered limitations, and, therefore, these amended three claims are believed to continue to be in condition for allowance.

Claim Rejections – 35 USC § 102

Rejections under 35 USC § 102(b) are reported in the Office action for claims 1 and 2 as being anticipated by U. S. Patent No. 6,583,572 (Veltrop et al.). These rejections are traversed.

Claim 1 is an independent claim, and claim 2 is dependent from claim 1. Therefore, if independent claim 1 recites subject matter of the invention neither explicitly nor impliedly taught in Veltrop et al. then both claims 1 and 2 are patentable over Veltrop et al.

[F]or [there to be] anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. (Emphasis added, MPEP § 706.02)

The conclusion asserted here as to dependent claim 2 also reciting subject matter not anticipated by Veltrop et al. if base independent claim 1 is not anticipated is premised, at least in part, from 35 USC § 112, paragraph 4, where it is directed that a “claim in dependent form shall be construed to incorporate by reference all the limitations of the base claim to which it refers.” Therefore, any claim 1 recited limitation not anticipated by Veltrop et al. also is incorporated in claim 2.

Turning to the action, it is asserted concerning claim 1 that:

...Veltrop discloses a matching network (28) (See Figure 2 and Figure 4) for coupling an RF power supply (26) to an RF antenna (24) (See Col. 4, lines 39-67) in a plasma generator (See Abstract) comprising:

- a resonantly tunable circuit formed of a variable capacitor (C3) and an inductor (106) in a series resonance configuration (See Col. 11, lines 34-44);
- a ferrite core (216) transformer (e.g. current transformer) (See Figure 5 and Col. 10, lines 12-39) coupled to the resonantly tunable circuit (See Figure 4). (Office action, p. 2)

Not traversed is the statement that Veltrop et al. disclose a “matching network...for coupling an RF power supply (26) to an RF antenna (24)...” This Veltrop et al. disclosed matching network 28, however, explicitly is described as:

Matching network 28 includes variable shunt capacitor 102 and variable series capacitor 104 having capacitance values which are varied by motors 88.

The output of matching circuit 28 is coupled in parallel to branches 81 and 83 via series inductor 106, RF voltage detector 108 and phase detector 109 (col. 9, lines 58-64)

Neither explicitly nor inherently disclosed here is that Veltrop et al. matching network 28 includes any transformer. What Veltrop et al. does disclose with respect to the Office action asserted “ferrite core (216) transformer” is that standing wave current magnitudes output from matching network 28 are detected by current amplitude sensors. These current amplitude sensors as disclosed by Veltrop et al. include current transformers, and it is one of these current transformers that is asserted in the action as being “ferrite core (216) transformer (e.g., current transformer) (See Figure 5 and Col. 10, lines 12-39) coupled to the resonantly tunable circuit (See Figure 4).” Specifically, Veltrop et al. disclose:

The magnitudes of standing wave currents at output terminals of branches 81 and 83 are respectively detected by current amplitude sensors 110 and 112, respectively inductively coupled to wire leads 111 and 113 that are connected between the low voltage ends of capacitors 84 and 86 and ground. As shown in FIG. 5, each of current sensors 110 and 112 includes a current transformer made of a toroidal winding 214 wound around a toroidal core 216. (col. 10, lines 8-15)

The cited "output terminals of branches 81 and 83" here are Veltrop et al. matching network 28 output terminals (See Col. 9, lines 62-64, reproduced above). The referenced capacitors 84 and 86 are variable capacitors coupling RF antenna 24 to ground (See Fig. 2). This figure explicitly shows Veltrop et al. matching network 28, the parallel matching network 28 outputs 81 and 82, RF antenna 24, and terminals of RF antenna 24 connected through capacitors 84 and 86 to ground. Therefore, Veltrop et al. Figure 2 by including these features discloses in an electrical schematic form that the Veltrop et al. matching network 28 does not include current sensors and, therefore, does not include ferrite core transformers or for that matter any other type of transformer.

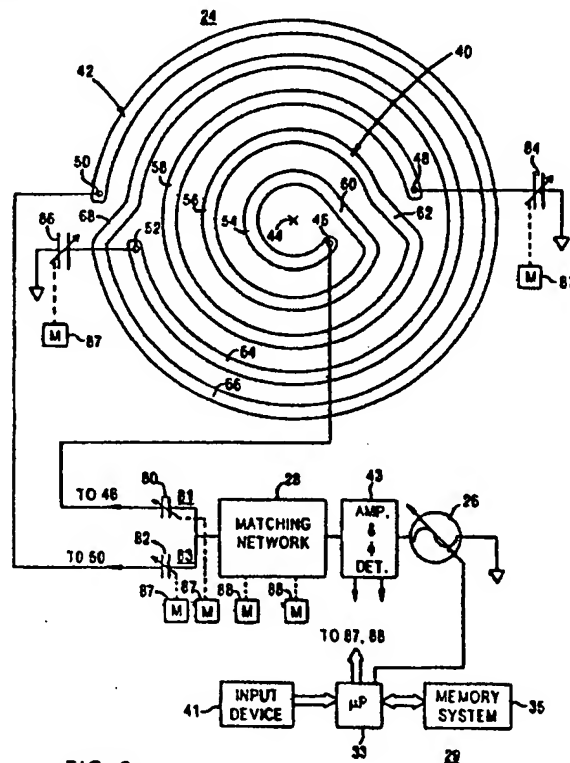


FIG. 2

In not explicitly or inherently disclosing a matching network circuit that includes any transformer, the Veltrop et al. patent absolutely fails to anticipate an aspect of the subject matter covered in claim 1. Identically because all claim 1 limitations are incorporated in claim 2 as directed by 35 USC § 112, paragraph 4, Veltrop et al. absolutely fail to anticipate claim 2.

It further is made of record that Veltrop et al. fail to disclose “a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration “as is recited in pending claim 1 because Veltrop et al. disclose the “output of matching circuit 28 is coupled in parallel to branches 81 and 83 via series inductor 106.” (Col. 9, lines 62-64) It is the combination of variable capacitor 104 with shunt variable capacitor 102 that Veltrop et al. disclose as their matching circuit 28 (See Col. 9, lines 58-61) not any combination of these capacitors with any inductor.

In conclusion, it is submitted that all reported anticipation rejections are overcome in view of the above discussions and as such these rejections are traversed.

Claim Rejections – 35 USC § 103

Rejections under 35 USC § 103(a) are reported in the Office action for claims 12 and 13 as being unpatentable over Veltrop et al. in view of U. S. Patent No. 5,006,760 (Drake). These rejections are traversed.

Claim 12 is an independent claim, and claim 13 is dependent from claim 12. If independent claim 12 is non-obvious then dependent claim 13 also is non-obvious.¹

¹ “Dependent claims are non-obvious under 103 if the independent claims from which they depend are non-obvious.” (Citations omitted, In re Fine, 5 USPQ2d 1596, 1600 (Fed.Cir. 1988))

It is asserted in the action without further explanation that except for a failure to disclose "a coaxial cable connected to the RF power supply (26)" Veltrop et al. "essentially disclose[] the claimed invention and further disclose[] a plasma ion or electron generator having the RF antenna (24) mounted therein (See Figure 1) for inductively generating a plasma..." (Office action, p. 3)

Claim 12, like independent claim 1, recites a: "matching network comprising: a resonantly tunable circuit formed of a variable capacitor and an inductor in a series resonance configuration; [and] a ferrite core transformer coupled to the resonantly tunable circuit." Veltrop et al., as is discussed above, fail explicitly and inherently to disclose such a matching network. Therefore, Veltrop et al. disclosure failures include more than "a coaxial cable connected to the RF power supply (26)".

Drake discloses a matching network 20, but as to the circuitry for the matching network 20 Drake only states that "[m]atching network 20 comprises an input 21 and an output 22 interconnected by suitable reactive components to provide a match between a power amplifier (not shown) and chamber 10." (Col. 2, lines 18-21) Drake does show a specific electrical schematic diagram for his matching network 20 in Figure 1.

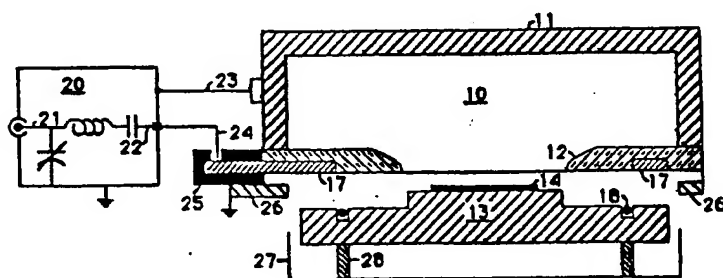


FIG. 1

However, not shown or suggested here are “a variable capacitor and an inductor in a series resonance configuration” or “a...transformer coupled to the resonantly tunable circuit.” Therefore, Drake cannot augment Veltrop et al. to provide disclosure of all limitations recited in claim 12.

It is submitted that these failures in Veltrop et al. and Drake render the reported obviousness rejections overcome. Accordingly, based on the above discussions, the reported obviousness rejections are traversed.

CONCLUSION

It is submitted that all pending claims are in condition for allowance in light of the combination of the reported claim allowances, now submitted claim amendments directed to overcoming objections reported for claims indicated to be allowable if amended, and the above discussions directed to reported anticipation and obviousness rejections. Accordingly, issuance of a Notice of Allowance reporting all pending claims allowed is requested.

Should the Examiner have any question, request or suggestion, he is invited to contact the undersigned attorney at the telephone number indicated below.

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Respectfully submitted,

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